

# PATENT SPECIFICATION



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**156,398**

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## PROVISIONAL SPECIFICATION.

### Improvements in Electrically Propelled Road Vehicles.

We, PAUL ALPHONSE HUBERT MOSSAY, MOSSAY & COMPANY, LIMITED, both Engineers, of 7, Princes Street, Westminster, London, S.W. 1, and RANSOMES, 5 SIMS AND JEFFERIES, LIMITED, Engineers, of Orwell Works, Ipswich, do hereby declare the nature of this invention to be as follows:—

This invention relates to improvements 10 in electrically propelled road vehicles the object being to provide a form of chassis and motor suspension which is economical to construct, while ensuring good spring suspension for the motors so that they are relieved of shock, good accessibility 15 to the motor armatures, driving wheels and accumulators, flexibility between the motors and driving gears and facility for assembling and dismounting of the driving road gears.

In carrying out the invention the longitudinals of the chassis, preferably of angle iron, are placed nearer together than usual so that the cross bearers overhang the longitudinals and form supports outside the longitudinals for shackles of the road wheel suspension 25 springs. Some of the cross bearers also form supports for the accumulator boxes 30 which may be suspended on the overhanging ends of those bearers beyond the longitudinals.

The motors are arranged one on each 35 side of the chassis being carried by brackets or feet cast integrally with the motor casting or castings bolted to the longitudinals. Each motor is mounted on the longitudinal on the opposite side to the road wheel it is to drive, the power 40 being transmitted from the motor through a universally jointed or cardan shaft and toothed gearing, preferably a double helically toothed pinion meshing with a

double helically toothed wheel on the road wheel. The pinion has a short 45 shaft mounted in ball bearings and connected with a Hookes coupling or other universal joint to the transmission or cardan shaft which extends across the chassis and is connected 50 to the armature shaft by another coupling or universal joint. The ball bearing for the short pinion shaft is mounted in an eccentric sleeve which in turn is mounted in the bracket or extension of the road 55 wheel bearing. By rotation of the sleeve the pinion can be brought into and out of mesh with the toothed wheel on the road wheel to permit of removal of the same. Any desired adjustment of the 60 pinion relatively to the wheel may be made. The sleeve may have a flange adapted to receive a lever or tool to facilitate adjustment, the sleeve being locked in its adjusted position by clamping the 65 bracket which may be split for this purpose. Grub screws may also be provided. The bracket is preferably tied to the chassis by suitable means to relieve the road wheel suspension spring of load due 70 to the torque on starting, for instance, a lever having a forked end pivotally connected to the bracket by a vertical pin may have its other end connected by a link to one of the overhanging cross-bearers, or to one of the brackets for one 75 of the spring shackles. The road wheels are preferably mounted on ball and/or roller bearings on a fixed axle, the bearings being attached to the laminated suspension springs, the shackles of which are secured to brackets on the overhanging ends of two of the cross bearers.

Brake drums may be fitted to the short pinion shafts between the couplings and 80 85

[Price 1/-]

the aforesaid eccentric sleeves, the flanges of which may carry pins for expansion rings or bands, adapted to engage with the interiors of the drums.

By the invention, the motor armatures and accumulators are easily accessible, the motors are well sprung and relieved of shock from the road, the gearing is

easily adjustable and the road wheel springs are relieved of undue stress on starting.

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Dated this 12th day of December, 1919.

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### COMPLETE SPECIFICATION.

#### Improvements in Electrically Propelled Road Vehicles.

We, PAUL ALPHONSE HUBERT MOSSAY, MOSSAY & COMPANY, LIMITED, both Engineers, of 7, Princes Street, Westminster, London, S.W. 1, and RANSOMES, SIMS AND JEFFRIES, LIMITED, Engineers, of Orwell Works, Ipswich, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in electrically propelled road vehicles the object being to provide a form of chassis and motor suspension which is economical to construct, while ensuring good spring suspension for the motors so that they are relieved of shock, good accessibility to the motor armatures, driving wheels and accumulators, flexibility between the motors and driving gears and facility for assembling and dismounting of the driving road gears.

The electrically propelled road vehicle according to the present invention comprises a chassis or main frame having means for supporting the road wheel suspension springs outside the longitudinals of said frame, and a pair of electric motors situated one on each side of the frame and adapted to drive the road wheel on the opposite side of said frame.

The drive from the motor to its respective road wheel situated on the opposite side of the chassis to that on which the motor is carried, is effected by means of a cardan shaft and double helical gearing, and means are provided for facilitating disengagement of the gearing when required for instance for cleaning or renewal purposes.

The invention also includes means for relieving the road wheel suspension springs from load due to torque on starting, and comprises further, the particular construction, combination and arrangement of parts as hereinafter described.

In order that the invention may be more readily understood reference will now be made to the accompanying diagrammatic drawings which illustrate by way of example one form of vehicle constructed in accordance with the invention.

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In the drawings:—

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Figure 1 is a plan view of the vehicle, broken away at its forward end.

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Figure 2 is a part sectional plan view on an enlarged scale of part of the chassis, showing one of the motors in position on one side and the driving connections whereby the drive is imparted to the road wheel on that side, from the other motor (not shown) on the opposite side, and

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Figure 3 is a detail view showing the preferred means for relieving the road wheel suspension from load due to torque on starting.

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In carrying out the invention according to one mode by way of example as illustrated by the accompanying drawings, the longitudinals 1 of the chassis, preferably of angle iron, are placed nearer together than usual so that the cross bearers 2 overhang the longitudinals and form supports outside the longitudinals for shackles of the road wheel suspension springs 3. Some of the cross bearers 2 also form supports for the accumulator boxes 4, which may be suspended on the overhanging ends of those bearers beyond the longitudinals.

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If preferred the overhanging portions of certain of the cross bearers for example the rearmost bearer, may be replaced by brackets bolted to the longitudinals.

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The motors 5 are arranged one on each side of the chassis, being carried by brackets or feet 6 cast integrally with the motor casting or castings 7 and bolted to the longitudinals. Each motor 5 is mounted on the longitudinal on the opposite side to the road wheel it is to drive, the power being transmitted from

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the motor 5 through a universally jointed or cardan shaft 8 and toothed gearing, preferably a double helically toothed pinion 9 meshing with a double helically toothed wheel 10 on the road wheel 11. The pinion 9 has a short shaft 12 mounted in roller or ball bearings 13, 13<sup>1</sup>, and connected by a Hookes coupling 14 or other universal joint (shown enclosed in a dust and weatherproof cover 14<sup>1</sup> in Figure 1) to the transmission or cardan shaft 8 which extends across the chassis and is connected to the armature shaft 15 by another coupling or universal joint 16<sup>1</sup>. The roller or ball bearing 13 for the short pinion shaft 12 is mounted within an eccentric sleeve 16 which in turn is mounted in the bracket or extension of the road wheel bracket 17. By rotation of the sleeve 16 the pinion 9 can be brought into and out of mesh with the toothed wheel 10 on the road wheel 11 to permit of removal of the same. Any desired adjustment of the pinion 9 relatively to the wheel may be made. The sleeve 16 may be provided with any suitable means for effecting its adjustment, for example, it may have a flange adapted to receive a lever or tool to facilitate adjustment, the sleeve being locked in its adjusted position by clamping the bracket 17 which may be split for this purpose. Grub screws may also be provided. The bracket 17 is preferably tied to the chassis by suitable means to relieve the road wheel suspension spring of load due to the torque on starting, for instance, a frame or lever 19 (Figure 3) having a forked end 20 and pivotally connected to the bracket 17 by a vertical pin 21 may have its other end 22 connected by a link 23 to one of the overhanging cross-bearers, or to one of the brackets for one of the spring shackles.

Brake drums 24 are fitted to the short pinion shafts 12 between the couplings and the aforesaid eccentric sleeves 16, the flanges 25 of which carry pins 26 for expansion rings or bands 27, adapted to engage with the interiors of the drums 24. The road wheels 11 are preferably mounted on ball and roller bearings 28, 29, on a fixed axle 30, the brackets being attached to the laminated suspension springs 3, the shackles of which are secured to brackets 31 on the overhanging ends of two of the cross bearers 2. By the invention, the motor armatures and accumulators are easily accessible, the motors are well sprung and relieved of shock from the road, the gearing is easily adjustable and the road wheel springs are relieved of undue stress on starting.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An electrically propelled road vehicle comprising a chassis or main frame having means for supporting the road wheel suspension springs outside the longitudinals of said frame, and a pair of electric motors situated one on each side of the frame and adapted to drive the road wheel on the opposite side of said frame, substantially as and for the purpose hereinbefore set forth. 70

2. In an electrically propelled road vehicle as claimed in Claim 1, the provision of a cardan shaft for connecting each motor to the road wheel driving gearing on the opposite side of the vehicle. 80

3. In an electrically propelled road vehicle as claimed in Claims 1 and 2, the provision of double helical toothed pinions for driving the road wheels, and eccentric sleeves for carrying the bearings for the shafts of said pinions, substantially as and for the purpose hereinbefore set forth. 85

4. In an electrically propelled road vehicle as claimed in Claim 3, the provision of flanges on the eccentric sleeves, provided with pins for brake expansion rings, and brake drums on the pinion shafts adapted to receive the expansion rings, substantially as and for the purpose hereinbefore set forth. 90

5. In an electrically propelled road vehicle as claimed in Claims 1 to 4, the provision of levers, attached at one end to the brackets which support the pinion shafts, and at the other end to the chassis or frame so as to relieve the road wheel suspension springs from load due to the torque on starting, substantially as and for the purpose hereinbefore set forth. 95

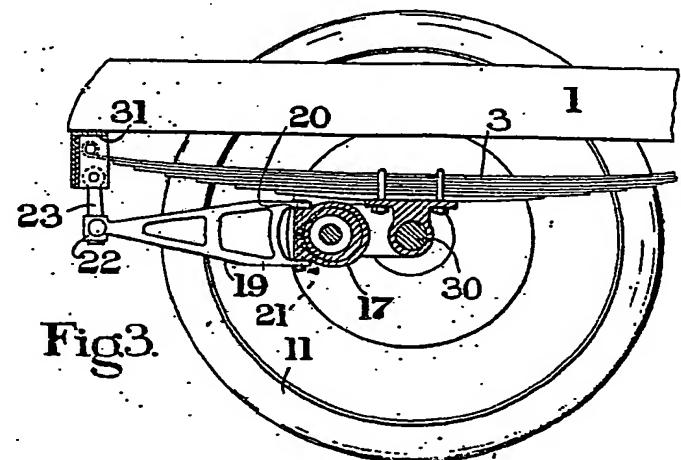
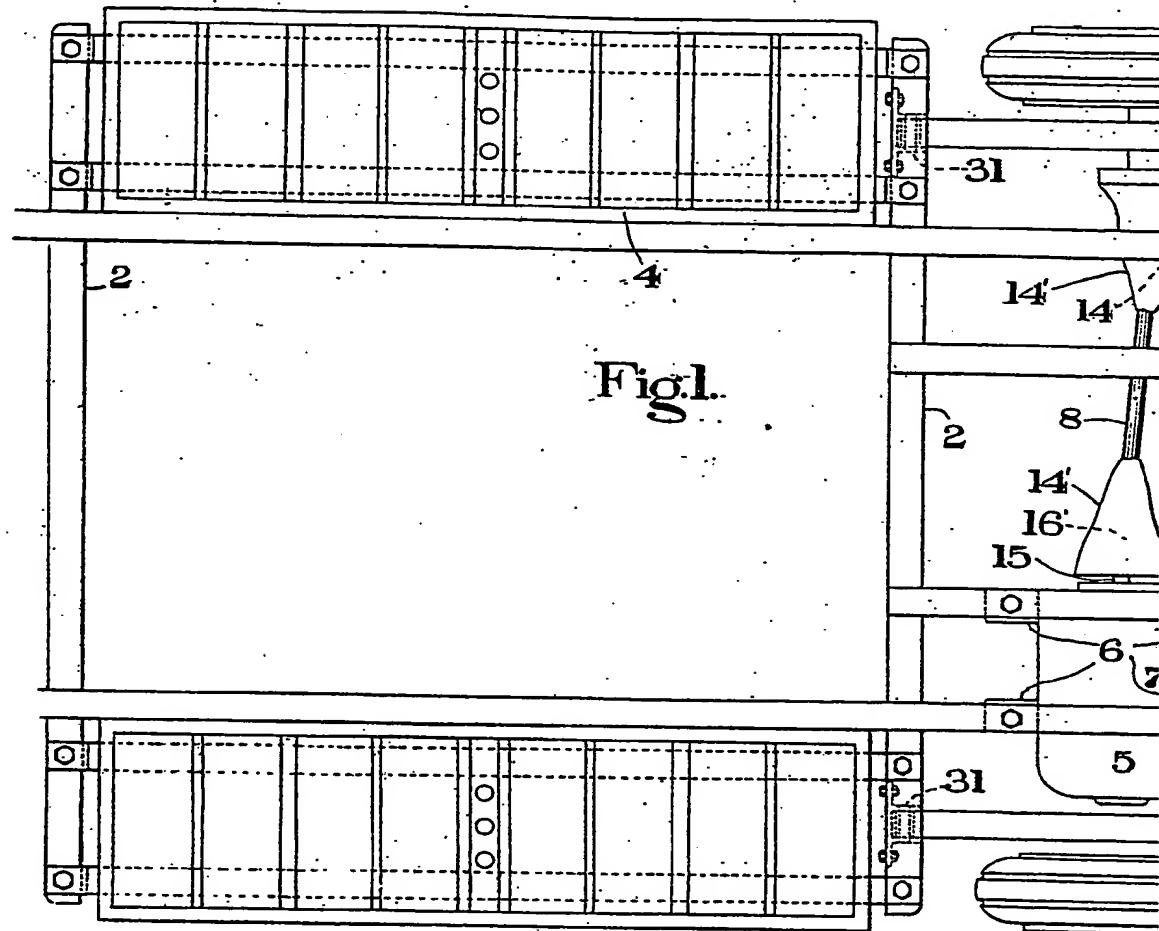
6. The improved chassis and motor suspension for an electrically propelled road vehicle substantially as hereinbefore described and illustrated by the accompanying drawings. 105

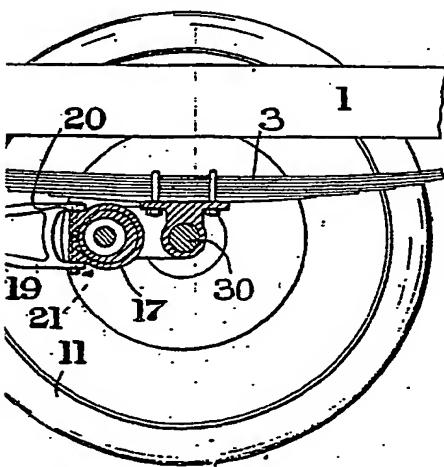
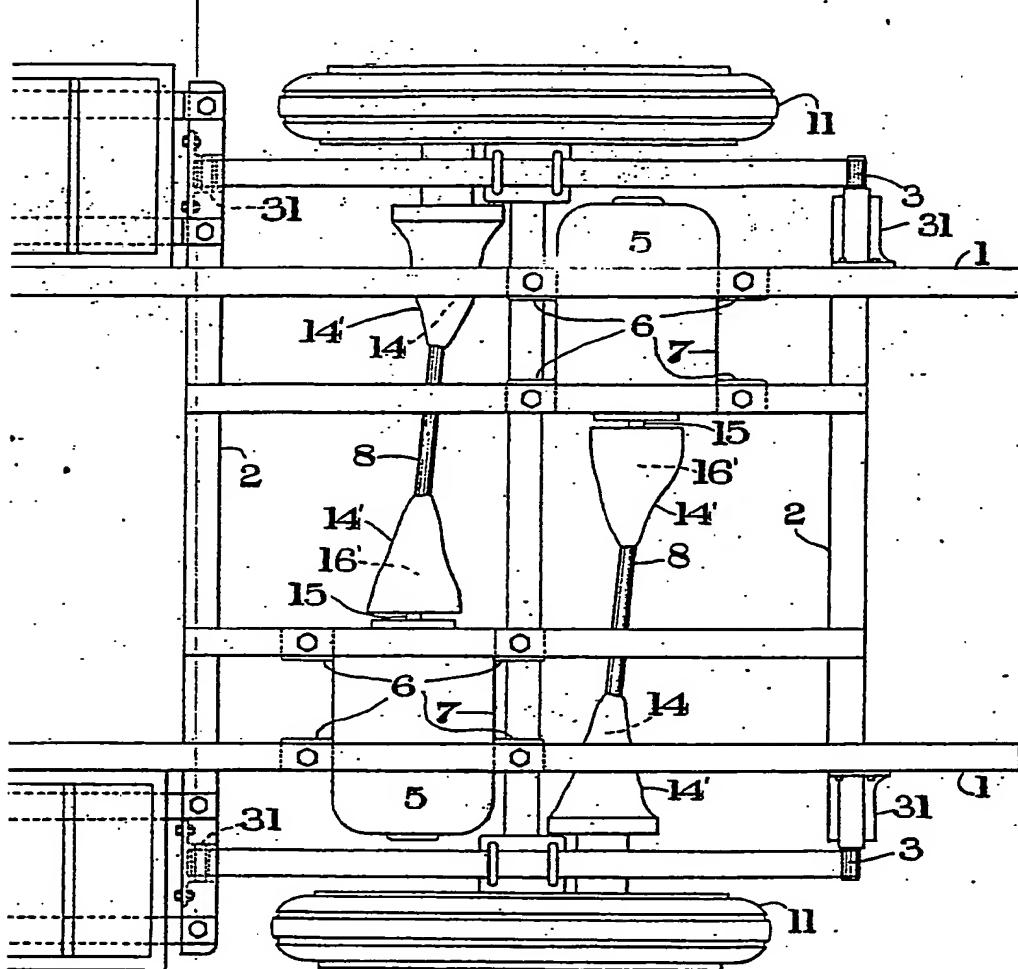
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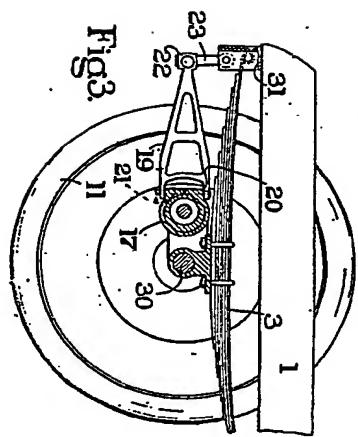
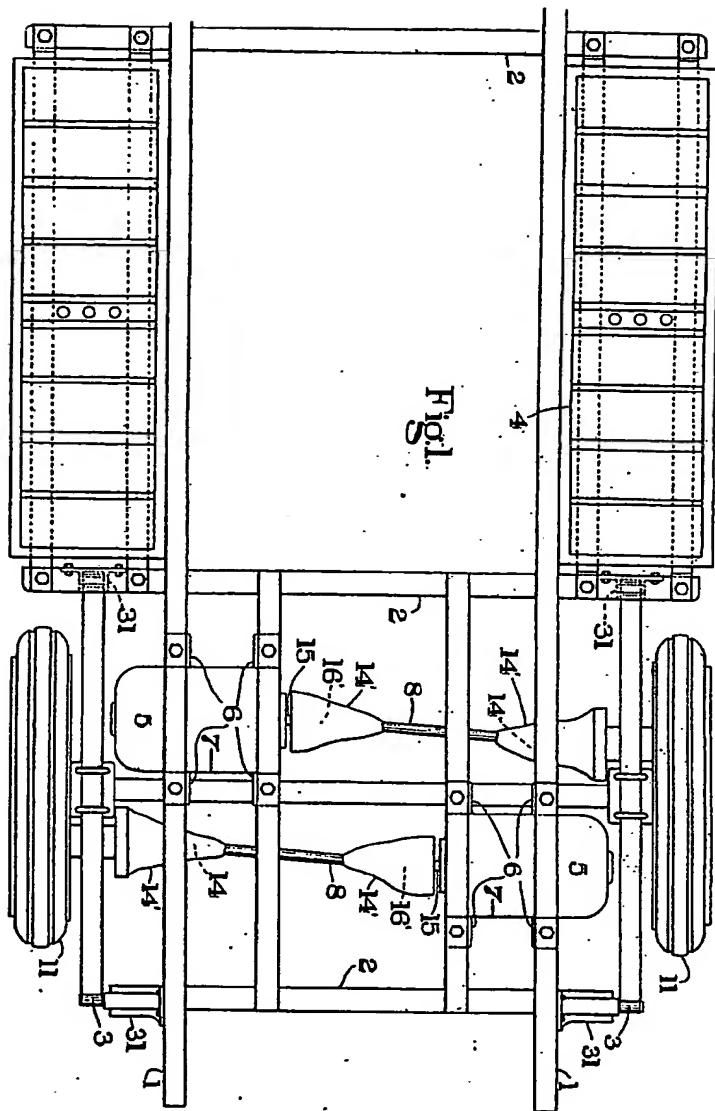
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Dated this 10th day of September, 1920.

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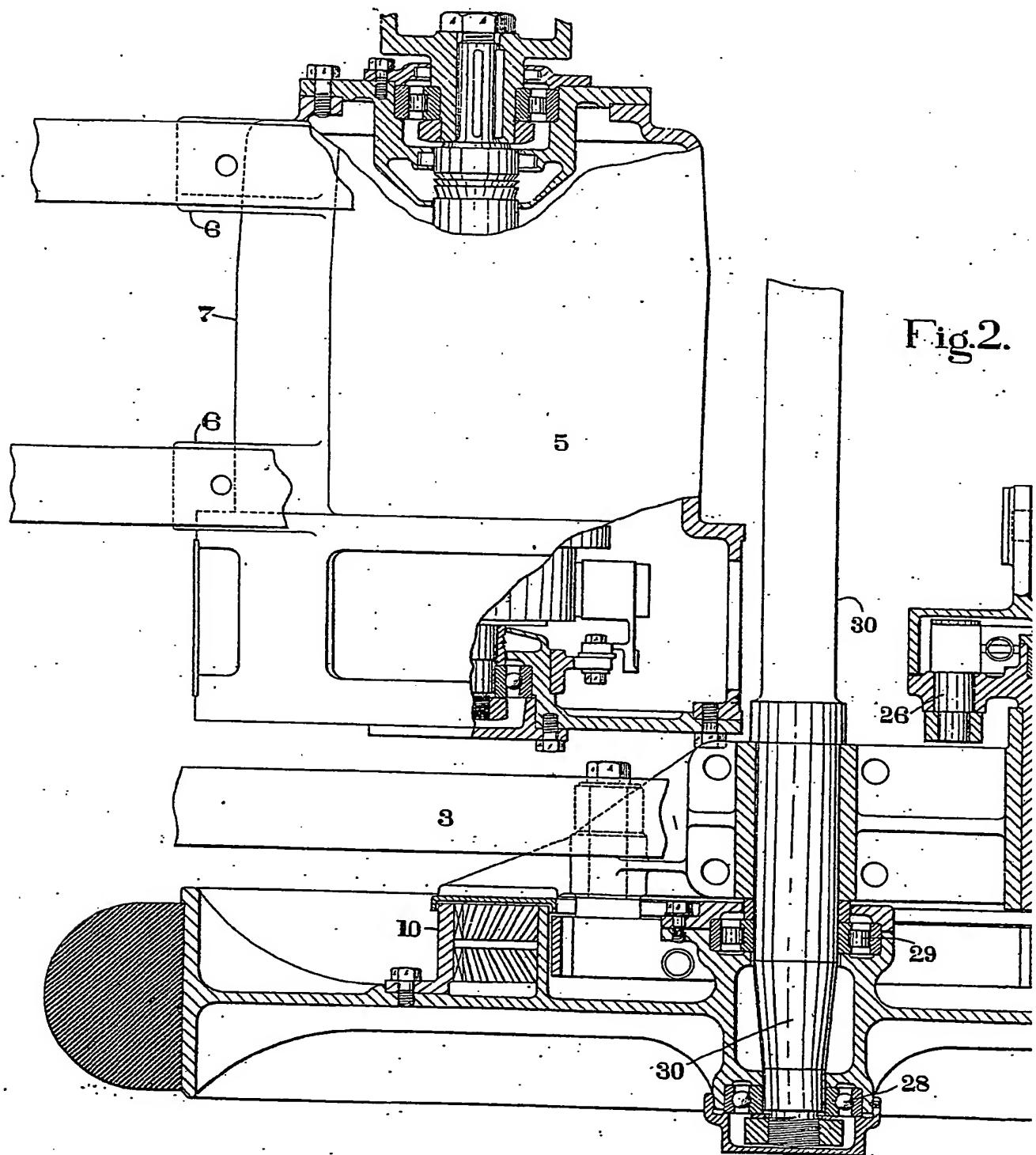


Fig.2.

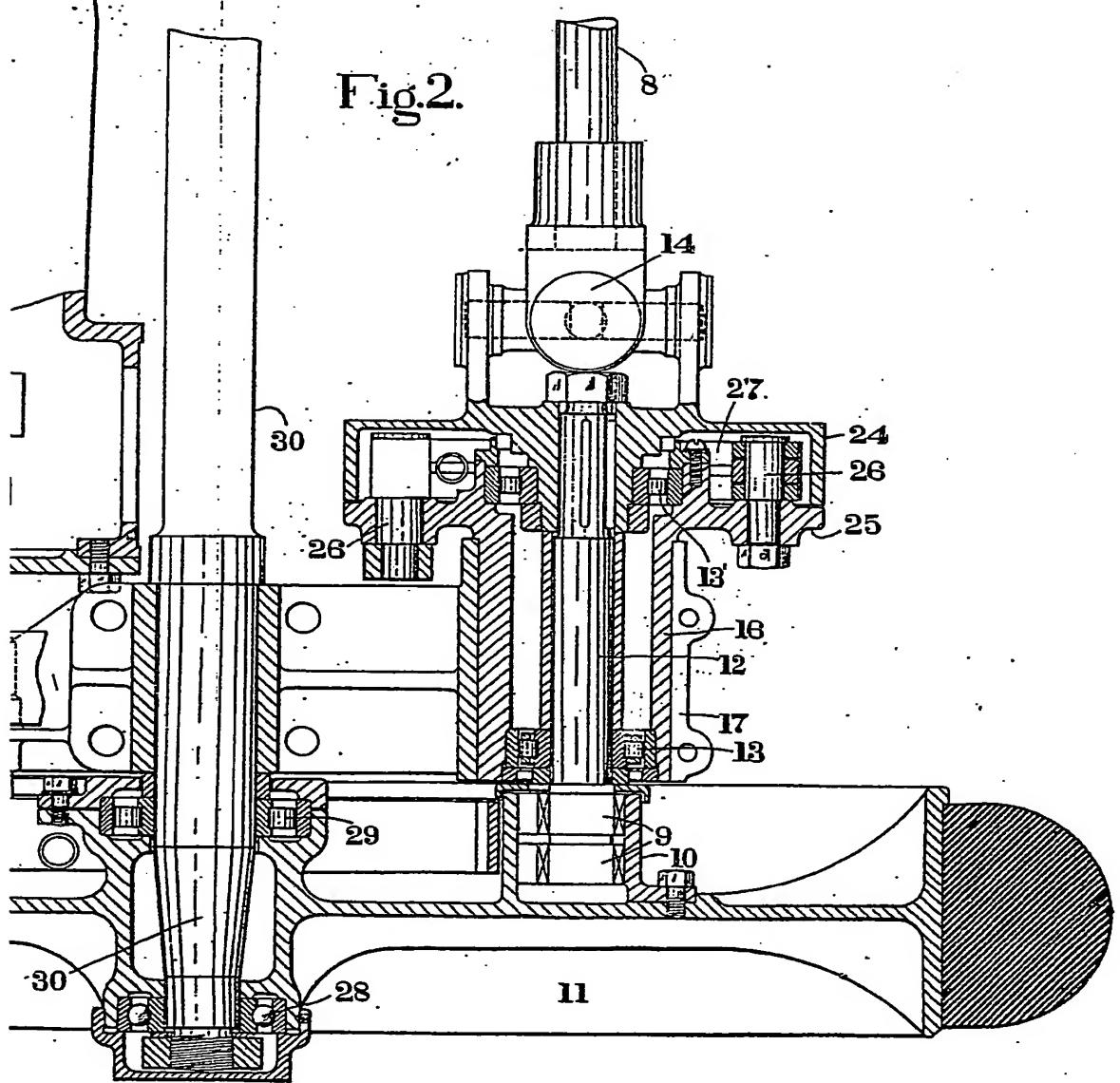


Fig. 2.

